

## ABSTRACT OF THE DISCLOSURE

An apparatus for inspecting a semiconductor wafer includes a vertically movable chuck plate for holding said semiconductor wafer, a first light source for illuminating an area on the wafer, a main imaging camera for detecting light scattered from the surface of the wafer and a main imaging lens for imaging the illuminated area of the wafer onto the camera. The apparatus additionally includes an auto-focus system for maintaining the wafer within the depth of field of the lens focal point. The auto-focus system comprises a second light source with associated optics, a linear position sensor with associated optics for detecting light from the second light source that is reflected off the illuminated area of the wafer, circuitry for converting the light detected by the sensor into an output voltage which is proportional to the relative vertical position of the illuminated area of the wafer. In use, the output voltage can be used to compensate for vertical deviations in the topology of said patterned wafer by vertically moving the chuck plate in real-time so that the lens images the area on the wafer onto the camera in focus.